ENERGY TECHNOLOGY ENGINEERING CENTER

OPERATED FOR THE U.S. DEPARTMENT OF ENERGY
ROCKETDYNE DIVISION, ROCKWELL INTERNATIONAL

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STANDARD OPERATING PROCEDURE DRR 21449 BT

TITLE: BUILDING TO64 INTERIOR FINAL SURVEY PROCEDURE

3151

- APPROVALS -

Written by:	C.D. Richards	RP&HPS Manager:	P. Rutherford 3/5/92
Facility Manager:	C.D. Richards	Quality Assurance:	P. Rutherford
Project Engineer:	P. Horton R.D. Meyer R. Meyer	Operations Manager:	T. Hunnicutt W.S. DeBear

REV. LTR.	REVISION	APPROVAL/DATE
A	Extensive revision incorporating the current final survey sampling procedures. Title and scope change. Retraining is required. DRR 24094 BT	2/22/93 2/25/93 2/22/93 2-25-93 2-25-93

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1.0 PURPOSE

This procedure defines the requirements for performing the radiological survey and sampling as required for the D&D activities identified in References 2.1 and 2.8. The scope of activity is essentially to grid and radiologically survey the interior surfaces of the structure (walls, floors, ceiling, columns and beams, fixtures, racks, etc.). The items of interest for these surveys are total and removable alpha and beta contamination, and ambient gamma activity. This is to ensure that all interior areas of Building 064 will meet all NRC, DOE and State of California criteria for release of the facility for unrestricted use. Included in the Appendix C is the sampling method to be applied to the data obtained in this survey procedure which will be used in the final radiological survey report for Building TO64. Analyses of the data will use "RADSRVY" for the final report.

1.1 Sampling Plan

The final radiological survey of Building 064 requires the repetition of specific steps for each of the areas surveyed. Figure 1 shows the general repeated steps for the final survey. Each area is treated as a separate sample lot for the purposes of statistical analysis. The sampling lots or areas are listed below (see Figure 2 for location with respect to Building 064 and surrounding grounds):

Sample Lot 1: Rooms 110, 104

Sample Lot 2: Room 114

Sample Lot 3: Rooms 116, 120, rest rooms

If contamination or high ambient radiation is found in any of these areas, the survey will be expanded into neighboring areas, a special decontamination procedure will be written to decontaminate those areas, and the area will be re-surveyed per this procedure.

1.1.1 Walls, Floors, and Ceilings

A uniform 3-m x 3-m grid shall be superimposed on the floors, walls, and ceilings. A 1-m x 1-m area within each 3-m x 3-m area shall be selected for survey. This shall be a random selection, if the 100% qualitative direct frisk of the area revealed no elevated count rates; otherwise, it should be biased toward that area

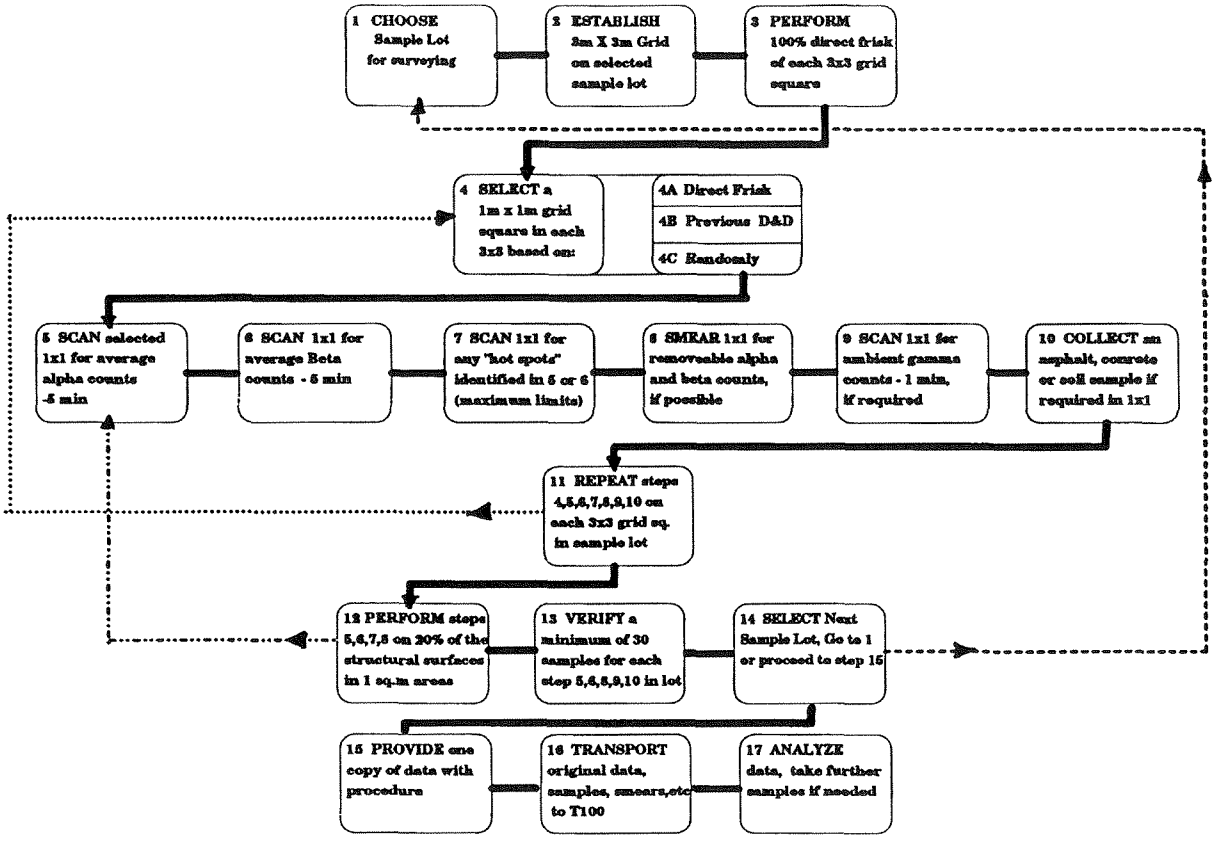

Figure 1. Sampling Plan Flow Diagram

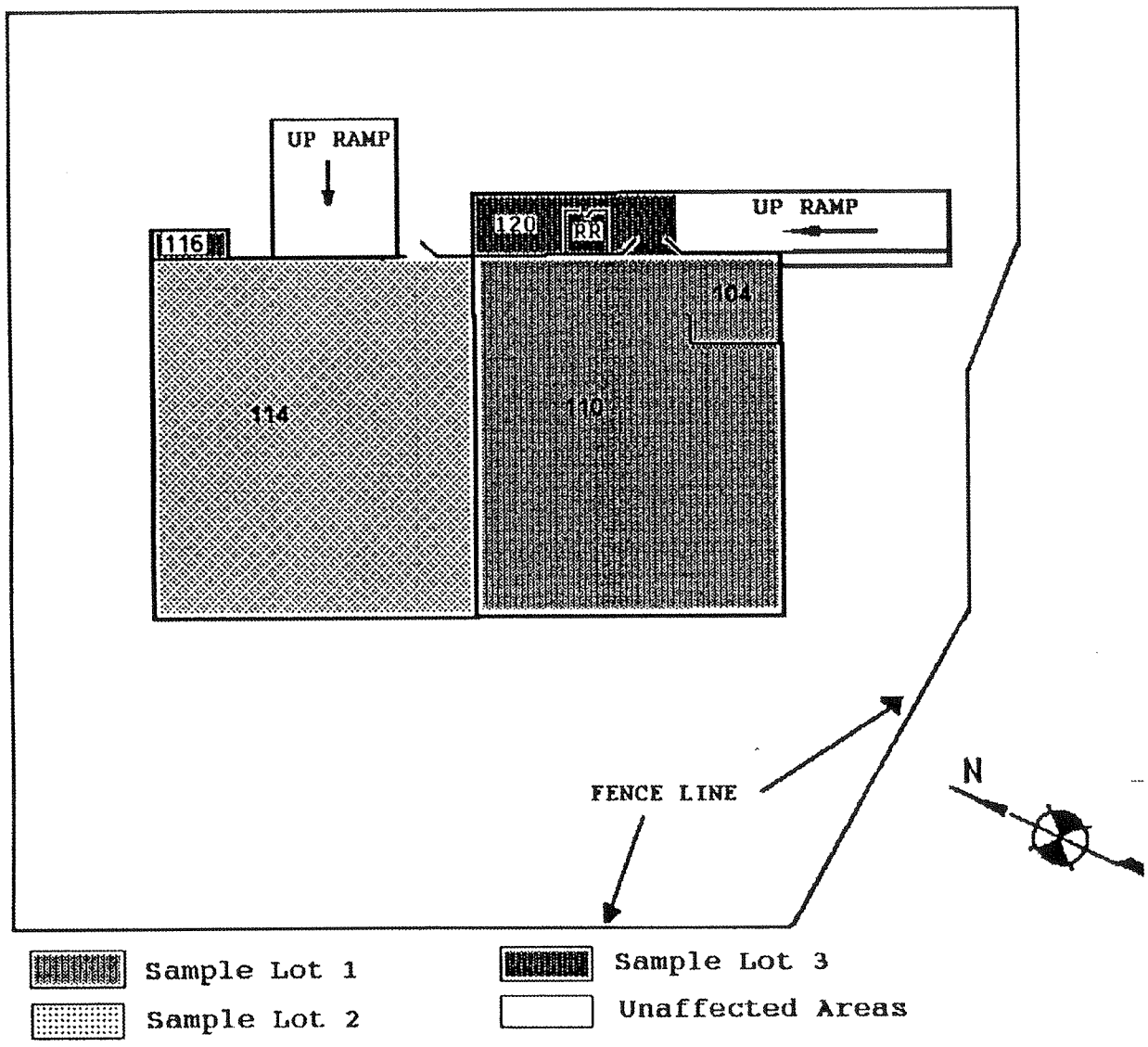

Figure 2. Building T064 Sample Lot Locations

which is expected to have had the highest contamination level. For surfaces having areas less than 3-m x 3-m, a minimum area of 1-m x 1-m shall be surveyed. A higher number of samples should be taken in those cases where the indicated procedure will result in fewer than 30 total data points for the entire sample lot.

1.1.2 Structural Surfaces

Structural surfaces will consist of beams, pipes, conduits, and other surfaces that are not amenable to large surface measurements. 20% of the structural surfaces shall be surveyed. The selection of surfaces to survey should be biased toward those expected to have the highest contamination levels (e.g. ledges, tops of conduit, etc.).

1.1.3 Concrete Pads

The scope of this survey includes interior areas ONLY; this section is not applicable.

1.1.4 Asphalt Paving

The scope of this survey includes interior areas ONLY; this section is not applicable.

1.1.5 Roofs

The scope of this survey includes interior areas ONLY; this section is not applicable.

1.2 Instrument Calibrations and Checks (Reference 2.3)

Measurements of the average and maximum alpha surface activities shall be made with alpha scintillation detectors, sensitive only to alpha particles with energies exceeding about 1.5 MeV. The detectors shall be calibrated with a Th-230 alpha source standard.

Measurements of the average and maximum beta surface activities shall be made with a thin-window pancake Geiger-Mueller tube. The detectors shall be calibrated with a Tc-99 beta source standard.

Measurements of removable surface activity (alpha and beta) shall be made by wiping approximately 100 cm^2 of surface area using standard smear disks. The activity on the disks shall be measured using a gas-flow proportional counter. The counters shall be calibrated using Th-230 and Tc-99 standard sources.

The ambient exposure rate at 1 m from surfaces will be measured using a 1-in. NaI scintillation detector. These instruments shall be calibrated against a Reuter-Stokes high-pressure ionization chamber, and daily checks shall be made using an Ra-226 source placed 1-ft from the detector.

All portable survey instruments shall be serviced and calibrated on a quarterly basis. In addition, daily (when used) checks and calibrations shall be performed on all instrumentation to determine acceptable performance. Reference 2.3 provides further methods and procedures for environmental surveys.

2.0 REFERENCES

2.1 SSWA-AN-0001, D&D Work Plan for Building 064, Environmental Restoration

2.2 GEN-ZR-0005, Radiological Survey of the Source and Special Nuclear Material Storage Vault - Building 064

2.3 N001OP000033, Methods and Procedures for Radiological Monitoring, Rev. A, dated 6/11/92

2.4 Rockwell International Form 732-A, Rev. 1-91

2.5 DOE Order 5400.5, Radiation Protection of the Public and the Environment, dated 2/8/90

2.6 Federal Register, Volume 46, No. 205, pages 52061 through 52063

2.7 ER-AN-0005, Training Plan for Environmental Restoration of Radioactively Contaminated Facilities, original dated September 17, 1991

2.8 NOO1OP000032, Training Program for Radiation Protection and Health Physics Personnel, Rev. A, 03/13/92

2.9 572-Z Rocketdyne Environmental Control Manual

2.10 N7045RR990031, Final Decontamination and Radiological Survey of the Building 064 Side Yard

2.11 ER-AN-0002, ETEC Environmental Restoration Program Management Plan

3.0 SPECIAL EQUIPMENT/MATERIALS

The equipment and materials listed below shall be available as required in advance of the work.

3.1 Equipment

3.1.1 Ludlum Model 2220-ESG Scaler/Ratemeter

3.1.2 Ludlum Model 43-1 Alpha Scintillation Probe

3.1.3 NMC Alpha/Beta Counting System

3.1.4 Ludlum Model 44-9 Thin-Window Pancake GM Probe

3.1.5 Ludlum Model 44-2 High-Energy Gamma Probe

3.1.6 Canberra Series 80MCA System with High-Purity Germanium Detector

NOTE

"Or equivalent" applies to all above model numbers.

3.1.8 Ladders

3.1.9 Scaffolding

3.1.10 Portable lighting

3.2 Materials

3.2.1 NPO smear discs, or equivalent

3.2.2 Miscellaneous nonhazardous operating supplies

NOTE

Review the list of hazardous (restricted) materials in Reference 2.9, EC 04.00.

3.3 Special Instrumentation Instructions

Record the equipment number, serial number, date, calibration date, and this procedure number on all radiation survey reports (Reference 2.4) and any other survey information documentation.

4.0 GENERAL REQUIREMENTS

4.1 Safety Precautions/Special Instructions

4.1.1 No special safety hazards to personnel and/or equipment should be present at the time of this survey.

4.1.2 General Health and Safety Instructions

The following general instructions shall be observed by all personnel:

a. After each workday, the facility shall be secured.

b. All equipment and/or materials removed from the areas called out in this document shall be secured at the end of each workday.

c. Protective Services will provide first aid support when required.

d. Any lifting equipment shall have the corresponding proof load documentation verified as current.

4.2 Limits

4.2.1 Surface Contamination Limits for Alpha and Beta (Reference 2.5)

	Allowable Total Residual Surface Contamination (dpm/100- cm^2)[1]		
Radionuclides[2]	Average[3,4]	Maximum[4,5]	Removable[4,6]
U-Natural, U-235, U-238, & associated decay product, alpha emitters	≤5,000	≤15,000	≤1,000

[1] As used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute measured by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

[2] Where surface contamination by both alpha- and beta-gamma-emitting radionuclides exists, the limits established for alpha- and beta-gamma-emitting radionuclides should apply independently.

[3] Measurements of average contamination should not be averaged over an area of more than 1 m^2. For objects of less surface area, the average should be derived for each such object.

[4] The average and maximum dose rates associated with surface contamination resulting from beta-gamma emitters should not exceed 0.2 mrad/h and 1.0 mrad/h, respectively, at 1 cm.

[5] The maximum contamination level applies to an area of not more than 100 cm^2.

[6] The amount of removable material per 100 cm^2 of surface area should be determined by wiping an area of that size with dry filter or soft absorbent paper, applying moderate pressure, and measuring the amount of radioactive material on the wiping with an appropriate instrument of known efficiency. When removable contamination on objects of surface area less than 100 cm^2 is determined, the activity per unit area should be based on the actual area and the entire surface should be wiped.

The beta limits on surface activity are the same as the alpha limits for uranium.

4.2.2 Surface Contamination Limits - Gamma (Reference 2.5)

Ambient exposure rate at 1-m $\leq$ 5 μR/hr above background (interior and exterior).

4.3 Prerequisites

4.3.1 A single designated "working copy" of this final survey procedure will be utilized at the work site. Should changes become necessary, the working copy of this SOP shall be redlined and approved by at least the person-in-charge (PIC), the Operations Manager, and RP&HPS; the program manager must approve and sign any changes affecting cost or schedule. At the completion of the task covered by this SOP, the Survey Procedure, with all redline changes incorporated and signed, and the required Appendices, will be in a predesignated area until placed in the project file.

The designated "working copy" of this SOP will be identified as such on the cover page and will be a located in an area designated for working copies.

NOTE

General training for RP&HPS personnel is conducted to Reference 2.8 and kept in Building T100 with RP&HPS Training Coordinator. Site specific training (facility familiarization and this procedure, etc.) must be performed by RP&HPS personnel and verified by the PIC.

4.3.2 Verify that all of the technicians working to these survey procedures have received training courses designated in the work plan and in Reference 2.7. When training is completed, personnel shall sign off training records (Appendices A and B). The PIC shall verify training by signing training records and forwarding to the ETEC Training Coordinator.

_____

4.3.3 The PIC shall verify that each employee working in the area has read and signed the control copy of this document to indicate understanding of the job and instructions.

_____

4.3.4 All personnel that will initial redlines for sign-offs shall sign the initial verification sheet in the back of these instructions.

_____

4.3.5 A serialized log book (obtained from ETEC Technical Information Center) shall be identified and kept current reflecting the activities conducted during this procedure.

_____

4.3.6 Photographs for the matter of records shall be taken at the discretion of the PIC.

_____

4.3.7 RP&HPS and the PIC shall verify daily that all daily radiation instrumentation calibrations and checks are made at the beginning of the work day, at mid-day, and at the end of the work day. The average of the backgrounds and efficiency factors determined at the beginning and end of each half-day shall be used with data obtained during that time period. All calibration

and check data shall be recorded on a standard health and safety instrument qualification data sheet. Acceptance limits for daily checks shall be established for each instrument at $\pm 2\sigma$ about the initial calibration value.

RP&HPS _____ PIC _____

4.3.8 The PIC shall verify that all work covered by this SP shall be performed by personnel trained as radiation workers. RP&HPS and Health, Safety and Fire Engineering (HS&FE) will provide monitoring and guidance as required for determining the protective clothing and safeguards needed.

PIC _____

4.3.9 The PIC will verify these prerequisites and discuss the tasks with management and the personnel performing the tasks at the start of each new assignment and on a daily basis during the duration of these operations.

PIC _____

4.4 Sequence of Activities

This survey procedure will sample three lot areas as described in Section 1.1. Each sample lot 1, 2, 3, (see Figure 1) has a specific section to perform first, Section 5.3, 5.4, or 5.5. These three sections will perform various general repeated steps in Section 5.2. Sections 5.3, 5.4, or 5.5 may be performed in any sequence; however, each sample lot must be completed before proceeding to the next sample lot (i.e., section). Steps 5.2.1 through 5.2.3 (average, total, and removable α and β contamination measurements) must be performed in sequence but steps 5.2.1 through 5.2.3 (α and β) measurements or 5.2.4 (ambient γ) measurements may be performed in any order.

5.0 DETAILED PROCEDURE

5.1 Verification that procedure is the latest revision and permission to proceed:

Facility PIC _____ Date _____ Time _____

5.1.1 Proceed to Section 5.3, 5.4, or 5.5.

_____

5.2 General Survey Procedures

NOTE

In order to facilitate the average and maximum contamination measurements, the alpha and beta probes should be connected by a common faceplate so that they can be moved over the survey area as a unit.

5.2.1 Alpha-Beta Average Contamination Measurements

CAUTION

A minimum of 30 samples each for average and removable contamination measurements must be obtained for each sample lot total area. Sample additional grid areas as required until 30 samples are obtained.

5.2.1.1 Identify the 1-m x 1-m area to be measured within each 3 x 3 meter grid square in the sample lot. If a structural surface is being surveyed, select a 2-ft section out of every 10 ft for sampling (or 20% of the structural area).

5.2.1.2 With portable scaler instrumentation set for a 5-min. count time, uniformly scan the area with the alpha and beta probes. Watch and listen for "hot spots" where radioactivity may exceed the average limit and mark the locations. These are to be resurveyed per Section 5.2.2.

5.2.1.3 Record the sample lot number, room number (if any), grid location number, alpha total activity averaged over 1 m^2, beta total activity averaged over 1 m^2, alpha survey instrument background and efficiency factor, beta survey instrument background and efficiency factor, instrument numbers, calibration dates, date and time.

5.2.1.4 Perform Section 5.2.2 for maximum alpha and beta contamination measurements on any areas identified in step 5.2.1.2.

_____

5.2.1.5 Perform Section 5.2.3 for removable alpha and beta contamination measurements if required (see Section 5.x at last step calling out Section 5.2.1).

_____

5.2.1.6 Repeat steps 5.2.1.1 through 5.2.1.5 for each identified 1-m x 1-m area to be measured for the sample lot being surveyed until all measurements for alpha and beta contamination have been recorded for the selected sample lot.

_____

5.2.1.7 Perform the next step in the sample lot invoking step 5.2.1.

_____

5.2.2 Alpha and Beta Maximum Contamination Measurements

5.2.2.1 Return to any area previously identified as having a "hot spot." Repeat the 5-min. uniform scan of only the "hot spot" area, covering approximately 100 cm^2 with the alpha probe, with the beta probe, or both as appropriate for the "hot spot."

_____

NOTE

If the maximum alpha or beta contamination measurements for a selected grid location are the only data listed in step 5.2.2.2 that has changed from step 5.2.1.3 records, record just those values; otherwise record all the information of step 5.2.2.2.

5.2.2.2 Record the sample lot number, room number (if any), grid location number, alpha maximum activity averaged over 100 cm^2 (record if applicable), beta maximum activity averaged over 100 cm^2 (record if applicable), alpha survey instrument background and efficiency factor (record if applicable), beta survey instrument background and efficiency factor (record if

applicable), instrument numbers, calibration dates, date and time.

5.2.2.3 Proceed to step 5.2.1.5.

5.2.3 Alpha and Beta Removable Contamination Measurements

CAUTION

A minimum of 30 samples each for average and removable contamination measurements must be obtained for each sample lot total area. Sample additional grid areas as required until 30 samples are obtained.

5.2.3.1 Using an NPO 2-in.-diameter cloth swipe, wipe an "S" or "Z" pattern with legs approximately 6-in. long, so as to sample removable contamination from an area of approximately 100 cm^2 within the 1-m^2 area identified and measured with the survey meters.

5.2.3.2 Place the smear in an envelope kit and record the sample lot number, room number (if any), grid location, date and time on the envelope. Save all envelopes for the sample lot together.

5.2.3.3 When all selected areas of the sample lot have been surveyed for removable contamination, deliver the envelopes to Building T100 or a designated place for counting and analysis.

5.2.3.4 Proceed to step 5.2.1.6.

5.2.4 Gamma Ambient Exposure Rate Measurements

CAUTION

A minimum of 30 samples for ambient gamma measurements must be obtained for each sample lot total area. Sample additional grid areas as required until 30 samples are obtained.

5.2.4.1 For each selected 1-m x 1-m survey area to be measured in the sample lot, position the NaI detector at a distance of 1 m from the center of the survey area using a 1-m tripod or equivalent holder.

5.2.4.2 Obtain a 1-min. integrated count on the selected grid area.

5.2.4.3 Record the sample lot number, room number (if any), grid location number, ambient gamma count, gamma survey instrument background and efficiency factor, instrument number, calibration date, date and time.

5.2.4.4 Repeat steps 5.2.4.1 through 5.2.4.3 until all 1-m x 1-m selected grid areas have been measured and recorded.

5.2.4.5 Proceed back to section invoking step 5.2.4.

NOTE

Any preexisting gridding may be used if it conforms to the requirements below in steps 5.3.1, 5.4.1, 5.5.1.

5.3 Sample Lot 1 Survey Procedure

5.3.1 Starting at one corner of an area or in a room (NW corner, if possible), a uniform 3-m x 3-m grid shall be superimposed on the floor and walls. Complete gridding for the entire sample lot.

5.3.2 Perform a 100% direct frisk of each 3-m x 3-m grid for alpha and beta. Select a 1-m x 1-m area within each 3-m x 3-m gridded area for further surveying based on any elevated count rates from the direct frisk, biased toward an area which would be expected to have had the highest contamination level, or a random selection.

5.3.3 Perform Section 5.2.1 and 5.2.2 (including Section 5.2.3) on selected 1-m x 1-m grid areas for average, maximum and removable alpha/beta contamination measurements.

_____

5.3.4 Perform Section 5.2.1 (including Section 5.2.3) on the structural surfaces in the sample lot.

_____

NOTE

Structural surfaces will consists of beams, pipes, conduits, and other surfaces that are not amenable to large surface measurements. 20% of the structural surfaces shall be surveyed.

5.3.5 Perform Section 5.2.4 (ambient gamma) measurements on the floors in sample lot 1.

_____

5.3.6 Take a paint sample scraping from the walls and ceilings from each previously selected gridded area from step 5.2.1 for analyses.

_____

5.3.7 Attach one copy of the survey records for sample lot 1 to this procedure and provide RP&HPS with the originals for data analysis.

_____

5.4 Sample Lot 2 Survey Procedure

5.4.1 Starting at one corner of an area or in a room (NW corner, if possible), a uniform 3-m x 3-m grid shall be superimposed on the floor and walls. Complete gridding for the entire sample lot.

5.4.2 Perform a 100% direct frisk of each 3-m x 3-m grid for alpha and beta. Select a 1-m x 1-m area within each 3-m x 3-m gridded area for further surveying based on any elevated count rates from the direct frisk, biased toward an area which would be expected to have had the highest contamination level, or a random selection.

_____

5.4.3 Perform Section 5.2.1 (including Section 5.2.3) on selected 1-m x 1-m grid areas for average, maximum, and removable alpha and beta contamination measurements.

5.4.4 Perform Section 5.2.1 (including Section 5.2.3) on the structural surfaces in the sample lot for average, maximum, and removable alpha and beta contamination measurements.

NOTE

Structural surfaces will consists of beams, pipes, conduits, and other surfaces that are not amenable to large surface measurements. A minimum of 20% of the structural surfaces shall be surveyed.

5.4.5 Perform Section 5.2.4 (ambient gamma) measurements on the floors in sample lot 2.

5.4.6 Take a paint sample scraping from the walls and ceilings from each previously selected gridded area from step 5.2.1 for analyses.

5.4.7 Attach one copy of the survey records for sample lot 2 to this procedure and provide RP&HPS with the originals for data analysis.

5.5 Sample Lot 3 Survey Procedure

5.5.1 Starting at one corner of an area or in a room (NW corner, if possible), a uniform 3-m x 3-m grid shall be superimposed on the floor and walls. Complete gridding for the entire sample lot.

5.5.2 Perform a 100% direct frisk of each 3-m x 3-m grid for alpha and beta. Select a 1-m x 1-m area within each 3-m x 3-m gridded area for further surveying based on any elevated count rates from the direct frisk, biased toward an area which would be expected to have had the highest contamination level, or a random selection.

5.5.3 Perform Section 5.2.1 (including Section 5.2.3) on selected 1-m x 1-m grid areas for average, maximum, and removable alpha and beta contamination measurements.

_____

5.5.4 Perform Section 5.2.1 (including Section 5.2.3) on the structural surfaces in the sample lot for average, maximum, and removable alpha and beta contamination measurements.

_____

NOTE

Structural surfaces will consists of beams, pipes, conduits, and other surfaces that are not amenable to large surface measurements. A minimum of 20% of the structural surfaces shall be surveyed.

5.5.5 Perform Section 5.2.4 (ambient gamma) measurements on the floors in sample lot 3.

_____

5.5.7 Take a paint sample scraping from the walls and ceilings from each previously selected gridded area from step 5.2.1 for analyses.

_____

5.5.8 Attach one copy of the survey records for sample lot 3 to this procedure and provide RP&HPS with the originals for data analysis.

_____

6.0 COMPLETION REVIEW AND APPROVAL

6.1 Procedure complete:

Facility PIC _____ Date _____

6.2 Procedure reviewed and satisfactory:

Project Engineer _____ Date _____

Quality
Assurance Engineer _____ Date _____

6.3 Procedure acceptable and available for external use:

Facility
Manager _____ Date _____

Operations
Manager _____ Date _____

RP&HPS
Manager _____ Date _____

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APPENDIX A

Training Certification Log

Name:		Operating instructions:	
Course Title	Expiration Date	Verify	Comments
RA physical			
Hazardous Materials ID and Handling (E-01)			
RA Hazardous Materials Packaging and Transportation (173TI000008)			
Confined Space Training (E-10)			
Radiation Safety, Basic (4013)			
Respirator (1029)			
Forklift and Crane			
Radiation Suit Up (4020)			
Mixed RCRA Waste Management and Control (EC-04.50)			
Facility Familiarization (B/064 and RMDF)			

APPENDIX B

Initials Verification Sheet

Printed Name	Initials	Date	Group/ Dept	PIC Verification

APPENDIX C

SAMPLING INSPECTION BY VARIABLES

Acceptance inspection by variables is a method of judging whether a lot of items is of acceptable quality by examining a sample from the lot, or population. In the case of determining residual contamination in the Building 064, it would be unacceptably time consuming and not cost effective to measure and document 100% of the building. However, by applying sampling inspection by variables methods, acceptable confidence in the conclusion made about the level of contamination can be achieved.

In acceptance by attributes, the radiation measurement in a given area is recorded numerically and classified as either being defective or nondefective, according to regulatory acceptance criteria. A defect means an instance of a failure to meet a requirement imposed on a unit with respect to a single quality characteristic. Second, a decision is made from the number of defective areas in the sample whether the percentage of defective areas in the lot is small enough for the lot to be considered acceptable. In acceptance inspection by variables, the result is recorded numerically and is not treated simply as a Boolean statistic, so fewer areas need to be inspected for a given degree of confidence in judging a lot's acceptability.

The test statistic, $\bar{x} + ks$, is compared to the acceptance limit U,

where $\bar{x}$ = average (arithmetic mean of measured values)

s = observed sample standard deviation

k = tolerance factor calculated from the number of samples to achieve the desired sensitivity for the test

U = acceptance limit

The sample mean, standard deviation, and acceptance limit are easily calculable quantities; the value of k, the tolerance factor, bears further discussion. Of the various criteria for selecting plans for acceptance sampling by variables, the most appropriate is the method of Lot Tolerance Percent Defective (LTPD), also referred to as the Rejectable Quality Level (RQL). The LTPD is defined as the poorest quality that should be accepted in an individual lot. Associated with the LTPD is a parameter referred to as consumer's risk (ß), the risk of accepting a lot of quality equal to the LTPD. USNRC Regulatory Guide 6.6 ("Acceptance Sampling Procedures for Exempted and Generally Licensed Items Containing By-Product Material") states that the value for the consumer's risk should be 0.10.

Conventionally, the value assigned to the LTPD has been 10%.

The State of California has stated that the consumer's risk of acceptance (ß) at 10% defective (LTPD) must be 0.1. For those choices of ß and LTPD, $K_ß = K_2 = 1.282$. The number of samples is n. Values of k for each sample size are calculated in accordance with the following equations:

$$K = \frac{K_2 + \sqrt{K_2^2 - ab}}{a}; \quad a = 1 - \frac{K_ß^2}{2\,(n-1)}; \quad b = K_ß^2 - \frac{K_ß^2}{n} \qquad (Eq.1)$$

where k = tolerance factor

K_2 = the normal deviate exceeded with probability of ß, 0.10 (from tables, K = 1.282)

$K_ß$ = the normal deviate exceeded with probability equal to the LTPD, 10% (from tables, K = 1.282)

n = number of samples

The criteria for acceptance of the survey are presented as a plan of action which will be included in the final survey report which evaluates the collected data and reports findings and conclusions.

1. Acceptance: If the test statistic ($\bar{x}$ + ks) is less than or equal to the limit (U), accept the region as clean. (If any single measured value exceeds 80% of the limit, decontaminate that location to as near background as is possible, but do not change the value in the analysis.)

2. Collect additional measurements: If the test statistic ($\bar{x}$ + ks) is greater that the limit (U), but $\bar{x}$ itself is less than U, independently resample and combine all measured values to determine if $\bar{x}$ + ks < = U for the combined set; if so, accept the region as clean. If not, the region is contaminated and must be remediated.

3. Rejection: If the test statistic ($\bar{x}$ + ks) is greater than the limit (U) and $\bar{x}$ (lex) > = U, the region is contaminated and must be remediated.

Thus, based on sampling inspection, we are willing to accept the hypothesis that the probability of accepting a lot as not being contaminated which is, in fact, 10% defective is 0.10.

SSWA-SOP-0001/bjb